

REMARKS

35 USC §103

Claims 1-13 (claim 14 herein canceled) are rejected under 35 USC §103(a), as being unpatentable over The Admitted Prior Art (Figure 1 of the Applicant's specification) in view of Akino et al. (JP Publication 08-296086).

Claims 1-13 (claim 14 herein canceled) are rejected under 35 USC §103(a), as being unpatentable over Akino et al. in view of The Admitted Prior Art.

The Applicant respectfully disagrees with both rejections.

Amended Claim 1 recites:

" A plating system comprising:

an elongated upper channel formed by two upper shields and an elongated lower channel formed by two lower shields, wherein each channel is separated by a gap between the upper and lower shields, wherein the gap is less than the height of a part being plated, and wherein the shortest distance from the part being plated to a channel wall is less than the shortest distance between the channel wall and an anode; and

a plating solution horizontal sparger comprising a series of inlets oriented to direct any plating solution flowing through the inlets directly into one and towards another of the upper and lower channels."

Given that this case has been pending for such a long time, it may be wise to take a fresh look at this application, the claims, and the motivation for the inventive and nonobvious subject matter in the current application.

First, it is necessary to point out several key sections of the current specification:

"An improved plating system 100 is shown in **Figure 2** which provides for improved metal distribution over a work piece 900. In the improved system 100, the vertical spargers (spargers 11 in **Figure 1**) found in prior art plating systems are eliminated and fluid 800 enters the chamber 120 through the bottom of the chamber with the bottom of the chamber acting as a horizontal sparger 110. By eliminating the vertical spargers, the distance D2 between the part being plated 900 and the shields 130 can be decreased (with a corresponding decrease in the distance D4 between the fields farming the sides of the channel)."

And the following from the original specification:

"The system of **Figure 2** may be obtained by modifying the system of **Figure 1** (a Technic Inc. MP 300 — and Applicant's Admitted Prior Art) in the following manner: (1) eliminating the tubular vertical solution spargers and replacing them with holes 111 fabricated in the lower plenum so that solution travels around the parts to be plated as a turbulent flow from the bottom of the parts to the tops, and not from the sides; (2) increasing the solution velocity; (3) moving the shields closer to the parts to be plated (cathodes); (4) incorporating part holding clamps sufficiently narrow so as to adequately hold the part while still permitting the claims and parts to move between the shields; and (5) incorporating a double rinsing and drying process where the plating/part holding fixture is rinsed and dried first, and the plated part and lower half of the fixture are subsequently rinsed and dried."

And finally from the specification for reference:

"It is contemplated that shielding the work piece/cathode of a plating system by moving the work piece within narrow channels formed by the shield rather than using the shields to shield the anodes by moving the shields closer to the anodes than to the parts being plated results in better distribution of deposited metal on the work pieces. As such, it is contemplated that the distance D3 between the shields 130 and the anodes 140 be greater than the distance D2 between a part being plated 900 and the

shields 130."

Amended claim 1 of the current application states several important features:

1. The plating system has an elongated upper channel formed by two upper shields and an elongated lower channel formed by two lower shields.
2. Each channel is separated by a gap between the upper and lower shields.
3. The gap is less than the height of the part to be plated.
4. The shortest distance from the part being plated to a channel is less than the shortest distance between the channel wall and an anode.
5. The plating solution horizontal sparger has a series of inlets oriented to direct any plating solution directly into one and toward another of the upper and lower channels.

Let's now review each of the cited references. First, the Examiner has cited Applicant's Admitted Prior Art. This citation is now rendered completely irrelevant for the purposes of this examination. In this reference, the following are true:

1. The plating system has an elongated upper channel formed by two upper shields and a series of vertical spargers and an elongated lower channel formed by two lower shields and a series of vertical spargers.
2. Each channel is separated by a gap between the upper and lower shields.
3. The upper and lower shields are used to shield the anodes (Reference number 14) from the vertical spargers and part to be plated.
4. The shortest distance from the part being plated to a channel is greater than the shortest distance between the channel wall and an anode.

5. The plating solution vertical spargers are located in both the lower channel and the upper channel and direct solution directly on to the part to be plated from the left and right of the part.

In Applicant's Admitted Prior Art – the design is completely different from the current design in the pending application. The shields in Applicant's Admitted Prior Art are right next to the anodes and designed to shield the current from the part to be plated. There is a large distance between the shields and the part to be plated – and much greater than the distance between the shields and the anode. The specification of the current application specifically states in one of the paragraphs that has been reproduced above that this decrease in distance in the current, inventive design results "in better distribution of deposited metal on the work pieces." This indication shows that the distance is very important to the final work piece plated product.

In addition, the upper shields and the lower shields have a gap between them that is smaller than the height of the part to be plated because the shields aren't designed to shield current, but instead are located specifically to introduce turbulence in the solution. Their positioning allows a turbulence to be produced in the plating tank.

These modifications to the Technic system render the claims of the current application patentable as not anticipated by Technic, because Technic cannot possibly anticipate the modifications disclosed in the current system and recited in the claims.

The Examiner then cites the Akino reference as both a primary and secondary/supplemental reference, as shown above. Akino has design differences from both Applicant's Admitted Prior Art and the current inventive design, and the Akino reference does not bridge the large gap between Admitted Prior Art and the current inventive design.

The Akino reference specifically states that the "Purpose" of the invention is "to

prevent the thinning of plating at the upper end of a metallic strip when a current shielding effect and a fluidizing effect are added and to uniformize the plating thickness distribution by forming the lower end of a current shielding plate into an optimum shape." So, it's instructive to break this section down to see the components of the Akino electroplating device:

1. A current shielding effect is provided that allows the current to only connect with the cathode or part to be plated.
2. A "fluidizing effect" is added that is basically designed to produce turbulence in the tank.
3. The "fluidizing effect" is formed by two things:
 - a) Use of a "fluid nozzle" to direct a pressurized fluid, such as air into the bottom of the tank; and
 - b) Use of an intentional angular design on the current shields to introduce additional turbulence at the top of the tank after the fluid flows over the part;
4. The gap between the upper shielding plates and lower shielding plates is not smaller than the height of the part to be plated – and this fact is because the upper and lower shielding plates are specifically designed to shield current. Note that the Akino reference states that the current shielding plates are positioned in both the conventional embodiment and the preferred embodiment to regulate plating current. The design difference in Akino that introduces turbulence is the angular point formed into the upper shielding plates.

The question remains whether one of ordinary skill in the art would review the Applicant's Admitted Prior Art and/or the Akino reference and combine them to form the claims of the current application. The Applicant contends that the answer must be no

for the following reasons.

First, there is nothing in the Applicant's Admitted Prior Art that would suggest that there would be a need to move the current shields closer to the part to be plated and replace the vertical spargers with horizontal spargers. One of ordinary skill in the art reading Akino after Applicant's Admitted Prior Art may consider moving the spargers down under the part to be plated in the tank, but would never get direction to move the current shields closer to the part than to the anodes and use them for a different purpose other than shielding current. Akino would seem to suggest modifying the shields to create turbulence in the upper part of the tank – but this modification is one of physical shape and not physical location within the plating tank.

Second, if one of ordinary skill in the art read the Akino reference, that person would see that in order to introduce turbulence into the tank, one needs to physically modify the shields. In addition, one can introduce a fluid nozzle in the bottom of a tank to produce additional turbulence. There is absolutely nothing in Akino to suggest that the upper and lower shields should be moved closer together, so much so that the gap between the upper and lower shields is less than the height of the part to be plated. There is also nothing in Akino to suggest that not physically modifying the shields would work just as well to introduce turbulence. There is no single embodiment of the Applicant's Admitted Prior Art that cures any of the defects of the Akino reference, when the Akino reference is used as the primary reference.

Therefore, Applicant's Admitted Prior Art, alone or in combination with Akino, cannot render unpatentable claim 1 of the present application, because one of ordinary skill in the art cannot possibly review the Admitted Prior Art or Akino on its face and arrive at claim 1.

**RENEWED REQUEST FOR TELECONFERENCE WITH EXAMINER AND
EXAMINER'S SUPERVISOR**

The Applicants have repeatedly and respectfully requested an interview as soon as possible to discuss this case with the Examiner and the Examiner's supervisor, if this case is not in condition for allowance. The undersigned Attorney-of-Record will start calling the Examiner within a week of filing this response to set up an interview to discuss this case.

This case has been pending for a considerable amount of time, and the undersigned attorney-of-record would like to resolve this case as soon as possible. Dr. Thompson can generally be reached any time Monday through Friday from 8AM to 3PM PST at 949-224-6282.

REQUEST FOR ALLOWANCE

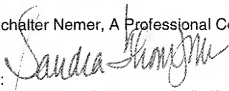
Claims 1-13 and 19 are pending in this application and the Applicant respectfully requests that the Examiner reconsider all of the claims in light of the arguments presented and allow all current and pending claims.

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Respectfully submitted,

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